AMERICAN
JOURNAL OF SURGERY

VOL. XXXVII. JANUARY, 1923 No. 1

THE TREATMENT OF UNUNITED FRACTURES.

WILLIS C. CAMPBELL, M.D., F.A.C.S.,
MEMPHIS, TENN.

Non-union or delayed union in fractures is seen with increasing frequency in recent years. The reason for this has not been stated. I believe this is probably due to a change in the nature of the fractures and also in their treatment as contrasted with past decades.

The recent developments in the methods of transportation and the great increase in manufacturing and hazardous industries has made for more, and more complicated, fractures. There are more multiple fractures, in which several bones are involved, more compound fractures and more severely damaged soft parts which may obviously deter circulation and callus formation. We know that in multiple fractures, deficient callus, with retarded union at one or more points, is quite common as the demand for new bone overtaxes callus output and lowers the quality of osteogenesis. Also, time required for solid bony union is much greater in compound, in lacerated, or contused parts, than in simple fractures.

Our methods have changed with the advent of the *x*-ray; and in the hands of those of wide experience there has been a decided advance. However, we have often observed that unless there is a proper interpretation of the roentgenogram, better results would be obtained by methods in common use prior to the discovery of the roentgen ray.

Twenty years ago the average practitioner was content to attain what appeared to be anatomical alignment and pronounced the bones "set." To-day the *x*-ray reveals a disturbing sight to the patient and to the physician, who too often makes several unsuccessful attempts to produce a satisfactory picture from a cosmetic standpoint. By such efforts nature's bone-forming elements are destroyed or materially damaged. If these attempts do not succeed the patient may be referred to the surgeon, who with his trauma, silver wire, plates, bone peg and grafts further insults nature and if an infection is avoided an ununited fracture might be considered fortunate.

In reviewing my private records for the past five years I found 1255 fresh fractures of which 63 were treated by open reduction. But this is a much larger percentage than would occur in the average run of fractures. Many cases were referred to my clinic on account of their complicated nature. I have found that the average time of consolidation is decidedly increased when incision is made into a fracture site; the duration of splinting is also prolonged, materially, interfering with the restoration of function. I do not employ open operation unless unavoidable. For instance, I have not found open reduction necessary in any case of fracture of the femur, though literature abounds with descriptions of various appliances for internal fixation. Not one fresh fracture from our records has resulted in non-union. Delayed union has occurred only three times, one of which was in multiple fractures where nine other breaks were associated. This does not include compound fractures, or fractures of the neck of the femur, the results of which were reported in *Annals of Surgery*, November, 1919.

In my three delayed unions, and in a large number of cases referred on account of retarded callus, I have used conservative treatment. A splint or cast is employed and function encouraged, consistently with fixation. Every thirty days the cast or splint is changed and mobility of the fragments observed. This is continued as long as solidity increases. As soon as false motion is decreased so that there is no movement apparent by the force of gravity (for instance when the leg hangs over a table with the knee extended) a brace is applied. Recovery by this simple routine is almost 100 per cent. In my clinic we have also used forcible manipulation, percussion, etc., under anesthesia and have injected blood serum, osmic acid and other irritants, but with no marked increase in osteogenesis. These measures are not applicable to fractures of the neck of the femur, in which location we are radical, advising open operation with bone graft at the end of eight weeks if no union has occurred. Central fractures of the neck, however, are a separate problem and I might say in a special class.

All of the common causes for non-union of fractures are too well known for discussion. From the

series of cases and observations, above noted, we have concluded that the causes for increase in the number of ununited fractures are: first, difference in type; second, improper interpretation of the *x*-ray picture with too frequent attempts to reduce and too frequent resort to open operation.

After six months or more has elapsed without effort on the part of nature to produce bony callus, the fracture should be considered ununited and radical measures instituted, though no arbitrary rule can

Fig. I. Usual inlay bone graft held in place with ligatures of kangaroo tendon or catgut.

be made as union may occur after a much longer period. The selection of the method of treatment depends on conditions. If there is wide separation of fragments, simple reduction with paring of edges may suffice. In a large percentage I have employed the inlay graft, which is generally considered to be the best method. There are, however, two objections. First, a considerable portion of the circumference of the bone must be removed from both fragments, thus decreasing by at least 10 per cent the callus-forming surface. Should the procedure fail and union not occur, or other complications arise, such as sepsis, the bones are permanently damaged

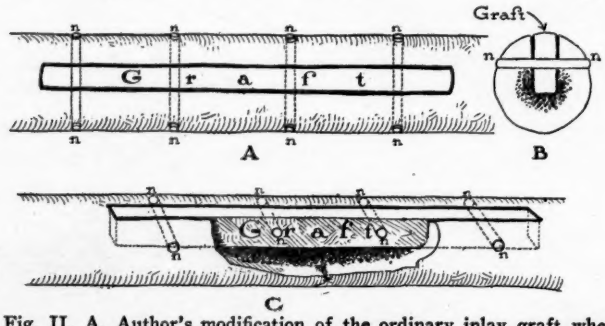

Fig. II. A. Author's modification of the ordinary inlay graft where extreme strength and stability are required.
A' A' Graft.
N' N' Bone nails extending through graft and cortex on both sides.
B. Cross section showing graft extending well down into the medulla.
C. A' A' B' B' Graft 1 ½ cm. wide placed edgewise into narrow groove in cortex of bone.
C. X' X' Y' Y' Section of cortex removed to show graft in place on lateral view.

with less chance of subsequent success. Second, firm fixation cannot always be obtained, especially in the shaft of the femur and both bones of the forearm; in fact, I have not been able to fix solidly any fracture by this method, and have, during the past two years, resorted to other measures, though I have not entirely discarded this valuable procedure.

From experience in my clinic we have concluded that two main factors must be closely observed in all cases: first, complete fixation; second, osteogenesis, which we think is best accomplished by employing the massive graft as described by Henderson, but we do not use beef bone or other foreign material. Our technic is as follows:

Routine dissection is made to the point of fracture. The fragments are pared so as to allow perfect coaptation. Great care is taken to chip as little periosteum from the bone, as possible. The attachment of muscle and soft tissues to the periosteum should not be severed except along the line of incision. A broad area is exposed for several inches on each fragment, depending upon the size of the bone involved, and the location of the fracture, and with a sharp chisel a flat surface is made on both fragments. Scar and osteoid tissue is reamed out of the medulla to healthy marrow, which is usually

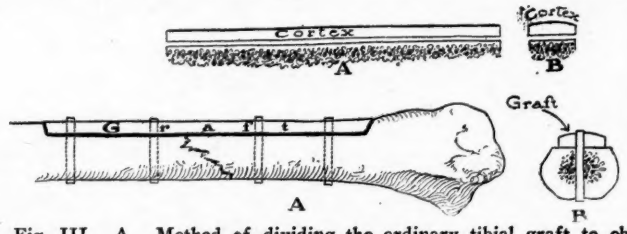

Fig. III. A. Method of dividing the ordinary tibial graft to obtain a thin strong graft for Fig. II or to lay on a small bone such as the radius when it is not desirable to remove too large an amount of the cortex.
B and C. Thin graft in position on radius held in place with bone nails. Portion *c c'* may be placed beside break for additional support.

from one-half to one inch of each fragment. A broad flat graft is next taken from the tibia, including periosteum, cortex and endosteum, the width and length of which depends on the part involved. With a motor saw the graft is split longitudinally through the edge or small diameter, into two parts, a strong outer plate consisting of the dense bone of the cortex, and an inner of a thin portion of the cortex with attached endosteum. Endosteum is removed with care from the inner half of the graft, a strip of which is placed within the medulla bridging the fracture as it is reduced. The heavy cortical portion of the graft is held firmly to the bone across the point of fracture. Three or four holes are drilled through the graft and bone. Bone nails are made from the cortical portion of the inner graft, or a second graft or small size can be easily secured. Small particles of endosteum are packed about the point of fracture and the tissues are closed tightly in layers. In order to facilitate this tedious procedure and complete the operation in reasonable time, a team of five is required. Two prepare the grafts and nails, while three carry out the technic of preparing the fracture.

With a limited number of femora and humeri we have used a different technic which consists in cutting a slot in both fragments about one-fourth

inch in diameter, after which a massive graft is removed and placed edgeways into the slot, and then both fragments are brought together. Autogenous bone nails are placed through bone and graft. The graft to some extent encroaches on the endosteum but not sufficiently to prevent satisfactory results. By these measures we have been able to so completely stabilize the fragments that no motion could be detected when the operation is completed. Nevertheless, external fixation is always applied.

In my series we have operated upon 78 ununited fractures. There were 11 failures, in 5 of which infections were apparently lighted up in those that were primarily compound. The remaining 6 failures we believe due to insufficient internal fixation. In earlier cases not reported in this series the proportion of failures was much greater, which we believe to be due entirely to lack of fixation.

In conclusion I desire to emphasize:

1. To avoid delayed union reduction of fractures must be accomplished with minimum trauma to the parts and without repeated attempts.

2. In open reduction, which is seldom necessary, care should be taken not to destroy or inhibit natural osteogenetic elements.

3. Two objects should be our constant aim in ununited fractures: fixation and osteogenesis.

An attempt is made only to analyze cases under my personal supervision and conclusions derived therefrom; not to discuss the various procedures.

FRACTURES OF THE FOOT.

In fractures of the tarsal bones of the midfoot early active mobilization should be advocated. In fractures of the metatarsals attention should be paid to the restoration of the anterior arch by the use of a pad beneath the ball of the foot. Any plantar angulation will lead to a considerable disability through the formation of callosities on the bottom of the foot and to the other symptoms of a metatarsalagia. On account of pain through weight-bearing one may have, in fractures of the metatarsal, a long disability. It is advisable to give these cases a considerable period of rest.—E. B. MUMFORD in the *Indianapolis Medical Journal.*

A fracture produced by only slight violence should at once raise the suspicion of a malignant growth. In such a case a uniform dark shadow about the bone as seen in the fluoroscope is to be interpreted as a neoplasm rather than as callus, for recent callus is not opaque to the *x*-rays.

PENETRATING WOUNDS OF THE ABDOMEN.*

WALTER M. SILLECK, B.S., M.D., F.A.C.S.,
Associate Surgeon, New York Post-Graduate Medical School and Hospital; Assistant Surgeon, Harlem Hospital.
NEW YORK.

This subject has been exhaustively discussed from a military standpoint. I shall here confine myself to abdominal penetrations as found in civilian practice, the implements in this particular community being pistols and knives.

In private practice it is most unusual to have these cases but in our large charity hospitals we not infrequently meet them. There is no type of case that demands the operative judgment or the accurate skill which this condition presents. Time is usually a very important factor, and so we find that "too much surgery is just as fatal as not enough."

Styles in weapons change. The larger calibers are now in vogue, although we do find injuries by every model, from the cheapest 22 caliber to the 45 service Colt.

Practically all of these wounds are made at close range, and in many instances the missile is not recovered. It is astonishing how little, and in other instances, how much damage may be done by a single bullet.

The search for lacerations must be thorough and expeditious, and often one may shrewdly guess the probable organs traumatized by the location of the entrance wound, or the line between entrance and exit wound if the latter exists.

Stab wounds, as a rule, cause very much less damage. The pocket-knife is the weapon generally employed and this has a short blade. The organ injured lies in close proximity to the wound. The lesion is clean-cut showing none of the explosive effect of the moderately high velocity missile, and we seldom find more than one intestinal perforation or more than one organ injured.

There are two main types of cases: one in which the abdomen is penetrated directly through the parietes; the other in which the penetration is indirect, as through contiguous regions. In the first the diagnosis is apparent; in the second it can, at times, only be surmised by indefinite abdominal signs, until confirmed by laparotomy.

SYMPTOMS.

While there may be definite signs of visceral perforation, this does not necessarily follow. Vomiting of blood, suggesting a stomach or duodenal injury; bloody stools indicating intestinal lesions;

*Read before the Greater New York Medical Society, May 15, 1922.

bloody urine pointing to vesical or genito-urinary tract involvement; escape of characteristic fluids from the wound, or protrusion of omentum or intestine, are significant symptoms commonly absent.

Shock and hemorrhage are practically always present and as entities are hardly separable. When shock persists, it usually indicates hemorrhage, the presence of which may be suspected from pallor, thirst, thready pulse, clammy skin, and possibly demonstrable shifting areas of dulness in the flanks. The most obvious and certain sign of an intra-abdominal lesion is the location of the entrance wound on the anterior or lateral portion of the abdominal wall. On the contrary, it is very difficult to decide whether wounds of the thoracic, lumbar, sacral, pelvic, gluteal or perineal regions have an intra-abdominal entry; in such conditions we are forced to rely upon the general symptoms, such as pain, vomiting, rigidity, tenderness, and pulse rate increasing with temperature.

It is desirable, not only to ascertain, when possible, the caliber and kind of missile, but also the distance at which the individual was shot, and the relative position of both principals at that time.

The symptoms presented by these cases on admission to hospital, show wide variation. Some patients appear to have nothing more than a slight injury, while others are moribund. To help us visualize these cases we may conveniently divide them into five arbitrary groups:

(1) *Perforating wound with no intra-abdominal injury.*

This is truly a rare condition but in our series we had three such cases. They presented no marked symptoms, they were in excellent condition, and had only the physical signs of an abdominal wound of entrance, with no wound of exit. On operation no visceral lesion was found and the recoveries were uneventful.

(2) *Hemorrhage without visceral lesion.*

Hemorrhage is practically always present in varying degree, directly dependent upon the severity of the laceration and the portion involved. In our series were six such cases without any visceral injury—4 gunshot and 2 stab-wounds, viz., (a) severed deep epigastric artery, 1 case; (b) large retroperitoneal collection in the lumbar region, 2 cases; (c) massive extra-vesical hemorrhage, 2 cases; (d) laceration of the descending meso-colon, 1 case.

Of this group there were 5 recoveries, the one death resulting from gas gangrene developing on the second day, in a wound of the right thigh. All of these patients showed signs of severe hemorrhage and in three we found a tender and distended abdomen.

(3) *Perforations of the hollow viscera.*

Under this heading we must include also combined injuries to hollow and solid organs, and by far our greatest number of cases came under this caption. Of these we have 35. It is surprising in some of these cases, how few and indefinite are the physical signs that may be elicited, though there may be multiple and extensive lacerations. In general, we may say that the intensity of the symptoms and the clearness of the physical findings are almost in direct ratio to (1) the duration of the condition; (2) the amount and virulence of the liberated intestinal content; (3) the degree of bleeding within the abdominal cavity.

When seen early these patients show the signs of shock, there is some abdominal tenderness and a suggestion of rectus spasm. Later these signs are gradually overshadowed by the increasing manifestations of peritoneal irritation, and there may be muscular rigidity, distension, pain, and vomiting. We must clearly bear in mind that the stomach, even with a relatively large hole in its upper portion, may retain its contents and, also, that a surprisingly small amount of material may escape from a small caliber wound of the intestine.

In these 35 cases there were 110 perforations of the small intestine; 13 of the colon; 11 of the stomach; 4 of the sigmoid; 5 of the liver and one each of the urinary bladder, spleen, gall-bladder, and ovary.

(4) *Injuries to the solid organs.*

These, without complicating lacerations elsewhere, are most unusual. We had six such cases: 5 injuries of the liver and 1 of the uterus. These patients showed varying degrees of hemorrhage and tenderness over the site of injury. The mortality here depends upon our ability to control the hemorrhage, which is generally extensive.

(5) *Massive hemorrhage.*

These patients are practically moribund when they reach the hospital; there is tremendous hemorrhage due to multiple and severe lacerations: and they die within a few hours for we are powerless to save them. Six of these cases were operated upon, all dying within six hours after leaving the operating room.

TREATMENT.

To present this comprehensively would be an unlimited task. No two cases offer the same problems, and only in a general way can some of the salient features be here outlined. A gunshot or a stab-

wound of the abdominal wall is sufficient indication for an immediate exploratory laparotomy; and in any case where there is even a fair suspicion of abdominal entry, it is much the safer practice to laparotomize at once. The incision should be so placed that it will most effectually bring into view the supposedly involved viscera. I advocate a large incision, as the wounds are usually multiple, necessitating a long methodical search. In some instances of numerous gut perforations, evisceration not only saves time, but diminishes the possibility of overlooking a lesion.

Solid organ lesions are either packed or, when accessible, such as the spleen, kidney, ovary, uterus, the organ may be removed if the hemorrhage is not controllable. In most instances sutures tear through and tend only to aggravate the condition.

Hollow viscus perforations are closed with an absorbable suture. Resection is indicated in (a) multiple wounds situated within a space of twelve or eighteen inches, (b) large tangential wounds, (c) injured mesenteric border (d) gross injury to the blood supply and (e) where the degree of closure would cause a definite obstruction.

Drainage is a much mooted question. I believe that a peritoneal cavity free from blood, and one in which there has been no gross soiling from intestinal contents, can safely be left without a drain. On the other hand, continued oozing, and the obvious presence of intestinal material, demands the institution of generous drainage. In our series drainage was employed in 38 instances.

On admission to the hospital, an immunizing dose of tetanus antitoxin is given; the patient is kept warm in bed and morphine is withheld until a diagnosis can be arrived at. Post-operatively, morphine with atropine is generously administered, retention enemas of glucose and whiskey are given; and after twenty-four hours colonic irrigations are instituted. Paralytic ileus is a fearsome and not infrequent complication; this should be recognized early, and vigorously combated. The diet should be increased as rapidly as is consistent with the patients' condition, and they should be encouraged to get out of bed just as soon as they are physically able.

PROGNOSIS.

This is greatly affected by the age and the general condition of the patient. Statistics on the mortality of penetrating wounds of the abdomen are of little value. Some operators will have much better success than others, either on account of having to deal with less severe injuries, or because of superior judgment and technic. Much depends upon the organs and structures injured, the amount of material escaped from the hollow viscera, the degree of hemorrhage, and the time elapsed since injury. One cannot say that a penetrating wound of the abdomen is invariably fatal when unoperated upon. We know that perforations of the hollow viscera sometimes close spontaneously, and also that hemorrhages from the solid organs do spontaneously cease. These happy results, however, are only too infrequent, and as in many other things, watchful waiting courts disaster. The transverse diameter, or caliber, the weight, and the velocity of a bullet are all important elements in the amount of damage it does. Without going into a tedious discussion we may dismiss this phase of the subject by saying that the larger the caliber, the greater the weight, and the nearer to medium the velocity of the bullet, the greater is the tissue damage. None of these missiles are pointed so the element of keyholing can be entirely disregarded.

Tetanus we successfully guard against; gas gangrene, although not frequently seen, is a grave possibility; and such complications as penetration of the chest cavity, diaphragm, and spine and cord injuries, fractures and soft part lacerations, all add greatly to the mortality.

CONCLUSIONS.

In the series here considered were 50 cases, and of these 35 recovered and 16 died. Many of these cases had multiple wounds which we have here entirely disregarded, having considered only those injuries involving the abdominal cavity. The average age was 27½ years. There were 44 males and 6 females. The average time elapsed from receipt of injury to operation was six hours, and the time in hospital was 20 days. There were 45 gunshot and 5 stab wounds.

Numerically, the cases found in each group, were as follows:

(1) without intra-abdominal injury	3
(2) uncomplicated hemorrhage	6
(3) perforations including injuries to solid organs	35
(4) wounds of only solid organs	6
	50

The sixteen deaths in our series were attributed to the following causes:

(1) massive hemorrhage, survived less than six hours	6
(2) progressive hemorrhage and shock	4
(3) peritonitis	3
(4) embolism	1

(5) secondary hemorrhage 1
(6) gas gangrene 1

16

I wish to thank Dr. John F. Connors, Director of Surgery at Harlem Hospital, on whose service these records were made, and to express my appreciation of the aid given to me by Dr. Posner, ex-house surgeon, in the compilation of these statistics.

445 PARK AVE.

POST-OPERATIVE TREATMENT*

JEROME SELINGER, M.D.,
Associate in Surgery, N. Y. Post-Graduate School and Hospital,
NEW YORK.

Post-operative treatment is a vital, yet a frequently neglected part of a patient's hospital sojourn. So many of us are absorbed with the "bigger things" in hospital routine that we are prone to slide carelessly over the "less important" details of post-operative care and comfort. Many patients successfully operated upon have succumbed because of lack of intelligent after-treatment, and many patients poorly operated upon have recovered because of proper and diligent after-treatment. I feel, therefore, that a review of the subject with special reference to the routine at the New York Post-Graduate Medical School and Hospital may be of some benefit. My remarks will refer to abdominal cases in particular.

Post-operative treatment begins in the operating room. The strips of adhesive plaster applied to the patient's abdomen should be shingled from below upward, thus preventing vomitus or other fluid from coming in contact with the wound and infecting it. Each successive strip of adhesive should be applied a trifle more loosely than the preceding strip, thus allowing a moderate amount of distention without discomfort. The gauze over the wound should be completely covered with adhesive plaster. If the patient's shirt is wet with blood, perspiration, or other fluid, it should be changed for a dry, warm one before he leaves the operating room. He should then be lifted carefully on to a wheel stretcher and surrounded with several hot blankets before being rolled into the draughty corridors of the hospital. These two latter details will undoubtedly reduce the number of post-operative pulmonary complications. While the patient is being operated upon it is a good plan to warm his bed thoroughly, thus eliminating any sudden change of temperature.

Generally speaking, every laparotomy case receives the following post-operative orders, the execution of which is begun immediately:

(1) Morphine, grs. 1/5, when necessary (size of dose depending upon the age and size of the patient), followed by grs. 1/6 every four hours when necessary.

(2) Absolutely nothing by mouth (including water) for twenty-four hours.

(3) Continuous Murphy proctoclysis.

(4) Moderate Fowler position.

Each of the above orders needs a certain amount of elaboration and I shall attempt to discuss them in turn.

(1) *Morphine*: We believe that every post-operative patient suffering with pain, and they all do, is entitled to relief. Nothing gives this relief so quickly and so satisfactorily as morphine. Therefore, we give it in its physiological dose for both pain and restlessness. If it is necessary to repeat it, and it generally is, we give a reduced dose to be repeated every four hours when necessary. The chief objections to this drug are that it reduces secretions and excretions, and that it causes distention. This affects the urine in particular and frequently necessitates subsequent catheterization. But we prefer to catheterize a patient several times, if necessary, rather than to allow him to suffer unrelieved pain. A very essential point in connection with the use of morphine is to discontinue its use absolutely at the end of twenty-four or thirty-six hours. In a majority of cases no narcotic or sedative is necessary after the second night, and we feel that it is bad practice to continue its use after this time. However, if a sedative is necesary after thirty-six hours, we resort to the use of the bromides, choral hydrate, luminal, or some drug other than an opiate. The reasons for this are numerous and obvious.

(2) *Nothing by mouth*: There are some of us who allow water as soon as the patient asks for it. It would seem that we have gone to the opposite extreme in withholding it for twenty-four hours. However, there is a limiting clause attached to this order. It is understood by those who have the patient in charge that if, at the end of several hours he is not vomiting, he may be allowed ordinary tap water in teaspoonful doses at frequent intervals, the amount gradually being increased. To give water immediately is, we believe, to invite vomiting, and it is frequently easier to prevent it than to stop it. If the patient is not dehydrated before or during the operation he will not crave water immediately upon regaining consciousness. If morphine is given at this moment he will probably go off to sleep and forget his thirst. Furthermore, if the Murphy proctoclysis is started at the proper time it will greatly aid in the alleviation of this symptom.

*From the service of Dr. Charles Gordon Heyd, Department of Surgery, New York Post-Graduate Medical School and Hospital, Dr. John F. Erdman, Director.

(3) *Murphy proctoclysis*: I know of no single contribution to post-operative or pre-operative treatment equal in value to the Murphy proctoclysis. This way of supplying the patient with both food and fluid, in addition to combating any tendency to acidosis, is the method par excellence. The routine Murphy drip at the Post-Graduate Hospital contains 1000 cc. of tap water, plus 10% (100 grams) of commercial glucose, plus 2% (20 grams) of sodium bicarbonate. This is heated to a temperature of 120° Fahrenheit and placed in an irrigating can from which it is allowed to flow one drop at a time. The rubber tubing through which it flows is passed between two hot water bags which lie at the foot of the patient's bed. This will, to a degree, restore some of the heat of the fluid that has been lost enroute. There are other methods of keeping the fluid warm, viz., surrounding the can with hot water bags, inserting a quart milk bottle containing boiling water into the can, the various patented vacuum bottles, or inserting a sixteen-candle power incandescent lamp into the can. These latter methods are probably superior to the first one mentioned. With hot water bags in the patient's bed the danger of a burn must ever be kept in mind. To the end of the tube is attached a number 32 French catheter or a straight or a curved hard rubber tip. This is inserted not more than two inches into the rectum and allowed to remain. The rate at which the fluid is allowed to flow is varied with the individual patient. Forty drops per minute is ordinarily satisfactory. If the patient does not retain and absorb the fluid, then the fault is not with him, but rather with the fluid or with the method of administration. The can may be hanging too high and the pressure may, therefore, be too great. The fluid may be flowing too quickly, it may be too hot or too cold, or the tip may be inserted too far into the rectum. Every individual will absorb fluid by rectum, and failure to do so should be the signal for the physician to find the fault with the apparatus, rather than with the patient. Under certain conditions, and with proper care and attention, I have seen patients absorb fluids to the amount of ten quarts, given continuously over a period of forty-eight hours. Ordinarily, however, this is excessive, and after the patient has absorbed one quart it is wise to wait an hour before starting a second one. Under these conditions three quarts can very easily be absorbed in twenty-four hours. Contrary to what one might expect, the rectal tip is borne with comfort and is not irritating.

The original proctoclysis as devised by Murphy consisted of a normal salt solution. It was soon discovered that, taken over a long period of time, saline solution is irritating to the rectum, that it increased rather than allayed thirst, that it frequently caused nausea and vomiting, edema of the eyes and ankles, and, rarely, of the lungs. The next step in the perfection of the drip was the use of ordinary tap water. This proved quite successful. Then our most ambitious associates began to medicate it, and then to incorporate various foodstuffs, such as eggs, milk, etc. Out of these various experiments has grown what we believe to be (and for which we claim no credit) the ideal method of proctoclysis. Its formula has been mentioned above. Glucose, being a simple sugar with a high caloric value, is readily absorbed and furnishes nourishment. When one is receiving food the tendency toward acidosis is greatly reduced. The sodium bicarbonate is an added measure against such an occurrence, and the tap water furnishes fluids to allay thirst.

In the recent past frequent mention has been made of the incorporation of tincture of digitalis in the Murphy proctoclysis. The chief formula of such a procedure is: tincture of digitalis 8 cc. plus routine Murphy drip 10 ounces. The effect of this drug is supposed to be two-fold: first, to prevent meteorism; second, to prevent tachycardia and to hasten the return to normal of the cardio-vascular system. There seems to be no proof that digitalis has a direct action on the intestinal musculature, and its prevention of distention, if it does prevent it, must be purely empirical. Our own experience in a limited number of cases is what one might term a negative one. We have seen no particular advantage in the use of digitalis by rectum. In fact, there have been with its use several cases of severe distention which is entirely contrary to our usual experience without the use of this drug.

(4) *Fowler position*: This is obtained by elevating the head of the bed from four to ten inches. The less active the peritoneum the less the absorption, and vice versa. We know that the pelvic peritoneum is the least active and therefore the least absorptive. The diaphragmatic peritoneum moves with each inspiration and each expiration, is the most active, and therefore the most absorptive. By elevating the head of the bed, any free fluid in the abdominal cavity will tend to gravitate toward the pelvis, where it will be slowly absorbed. If an elevation of more than eight inches is required it will be necessary to place a pillow under the patient's popliteal spaces. If this is not done, he will slide down toward the foot of the bed and be most uncomfortable. Modern hospitals are well supplied with Gatch beds, which have a spring that is hinged in two places. This makes it possible to flex a patient at

his hip and knees and is more satisfactory and more comfortable than the original Fowler position.

Nausea and vomiting occur in practically all post-anesthetic cases. When we have conquered this disagreeable feature of operations we shall have made a distinct step forward. Usually, after vomiting several times, the patient will be able to retain small quantities of water by mouth, and this unpleasant symptom then disappears. Not infrequently, however, considerable difficulty is experienced before a patient can be made to stop vomiting. If he has vomited several times and he continues to "spit up" small quantities of bile-stained fluid, then steps should be taken to empty his stomach. Our first procedure is to give him a tumbler full of warm water in which has been dissolved 1 dram of sodium bicarbonate. We request him to drink all of it, hoping that one of two things will happen: either that the pyloric sphincter will open and the stomach empty itself into the small intestines; or that it will act as an automatic lavage by a complete emptying of the stomach into a pus basin. In a great majority of obstinate cases this simple procedure will suffice and the patient goes on to convalescence without further difficulty. Occasionally they vomit in spite of this treatment, and it becomes necessary to institute further measures. We believe that one is justified in repeating the above measure before resorting to the stomach tube. If vomiting persists after the second automatic lavage, then the stomach tube should be used without further delay. We do not hesitate to use it after any type of abdominal section, including a resection of the stomach. In the latter type of case it should be passed with great care, it should not be inserted so far as in those cases where the stomach is not operated upon, and less fluid should be instilled. Ordinary water at a temperature of 110° F. containing a dram of sodium bicarbonate to the pint is an ideal fluid to use in these cases. The lavage should be continued until the fluid that returns is clear, care being taken that the amount of fluid recovered each time is the same as the amount instilled. The continued retention of a large amount of fluid may cause a rupture of the gastric suture line.

Distention and meteorism to any degree are the exception rather than the rule. The proper application of adhesive straps will allow for a moderate amount of distention without discomfort. If, however, the patient is distinctly "blown up", then measures should be immediately instituted to relieve him. Our first step in this direction is the insertion of a rectal tube. If this is properly inserted beyond the internal sphincter, it frequently allows the painless passage of gas. (If the patient is still receiving proctoclysis, then the latter is temporarily discontinued.) Failing in relief by the use of the rectal tube, we resort to one of the various enemas. Those mentioned below are all eminently satisfactory:

Soapsuds enema—1000 cc. water at 110° F. thoroughly mixed with soapsuds.

Milk and molasses enema—1 pint of milk and 1 pint of molasses at 95° F.

Ox-gall enema—2 ounces of ox-gall, 2 ounces of glycerine, 2 ounces of turpentine, 1 pint of soapsuds, at 110° F.

Alum enema—2 ounces alum sulphate, 1 pint of water, 110° F.

Ward enema—2 ounces saturated solution magnesium sulphate, 2 ounces glycerine, 3 drams turpentine, 1 pint soapsuds, at 110° F.

There are other enemas that are equally efficacious. When, after operations upon the colon, an enema is necessary, not more than eight ounces of any fluid should be used at one time. Frequently an ox-gall enema will give an excellent result when a milk and molasses enema fails, and vice versa. The same may be said of the other types. There appears to be no particular choice.

Hiccough is a not infrequent complication of abdominal operations. When it does occur it is, as a rule, readily amenable to the most simple kind of treatment. Occasionally, however, it is a very difficult symptom to treat, and there are on record not a few cases of death directly attributable to it. Probably the most frequent cause of hiccough is a reflex stimulation of the phrenic nerves operating through the gastric branches of the vagi. This would seem to indicate a disorganization of the gastric chemistry and treatment should be directed accordingly.

Various physical measures as well as numberless household remedies and drugs have been used to combat this condition. Among the most frequently used may be mentioned repeated gastric lavage with several quarts of warm water containing 2 drams of sodium bicarbonate to the quart; the drinking of a tumbler full of water, or of a few drops of water; allowing a little table salt or sugar to dissolve on the tongue; one drop of tincture of iodin in a teaspoon of water repeated every fifteen minutes for four doses; allowing a little ice to dissolve on the tongue; small quantities of lemon juice, orange juice or vinegar; holding the breath; drinking water while holding the breath; encouraging the patient to vomit, either by stimulating the palate or by the use of drugs; free catharsis; eating of solid food; cocaine or morphine by mouth or under the skin; chloral hydrate; the bromides; epinephrin; luminal; chloroform anesthesia; massage; the application of a tight

abdominal binder; forced flexion of the thighs on the abdomen; the esophageal sound; intubation. With such a series of remedies, comment is hardly necessary. It appears that we do not know the cause of singultus, and the treatment is therefore purely empirical. We should leave nothing untried in attempting to relieve a patient quickly and permanently of what the laity considers a trivial complaint.

Acute dilatation of the stomach is a rather rare occurrence in our hospital. Its incidence, however, is greater than one might suppose, and it is frequently unrecognized. When this unfortunate complication occurs it must be treated early, energetically, and persistently. Gastric lavage is the only treatment of any real service. The patient's stomach should be kept empty of fluid and gas, even though it be necessary to lavage it every hour. Frequent change of position to the right lateral or knee-chest may be of some benefit. Pituitrin or eserine given intravenously are of questionable value.

It has not been many years since the post-operative treatment of *shock* was almost a routine. At present it is very unusual to walk into any of the wards of the Post-Graduate Hospital and see a patient in the shock position. This condition is now anticipated. Dehydrated patients are not operated upon until their fluids have been replenished. The wet preparation is no longer used; less anesthesia, warm operating rooms, less exposure and manipulation of the viscera, restricted loss of fluids at operation, morphine post-operatively and the Murphy proctoclysis are all prime factors in preventing what was once a common occurrence. There are many theories as to the cause of shock. For a detailed explanation of this symptom one will find the numerous writings of Crile most exhaustive. The most important points to bear in mind are that we are dealing with (1) exhaustion of the vaso-motor center, (2) a marked fall in blood pressure, (3) cerebral anemia, (4) collection of blood in the splanchnic veins. The treatment should be directed accordingly.

The usual Fowler position should give way to the shock position, in which the foot of the bed is elevated eight or ten inches. Every possible attempt should be made to conserve the body heat. The patient should be well surrounded with hot blankets, and numerous protected hot water bags should be put into his bed. Abdominal massage and gentle artificial respiration are of benefit. They aim toward relieving the splanchnic congestion and distributing blood into the depleted arterial system. The immediate infusion of 1000 cc. of normal saline solution containing 100 grams of commercial glucose, to be repeated if necessary, is frequently a life-saving measure. Fifteen minums of a 1/1000 solution of adrenalin chloride should be injected into the tube through which the above fluid flows. This drug has a distinct action on the arterioles and raises the blood pressure. Its effect, however, is very transient and it should be repeated every half hour. An ampule containing 1 cc. of pituitrin is also recommended. Its effect is more prolonged than that of adrenalin. Medication by mouth is of no value. Stimulation by rectum is of distinct benefit, not alone by reason of any drug that may be used, but also because of the stimulating effect of the heat contained in the fluid that is instilled. The installation into the rectum of six ounces of strong black coffee, plus two ounces of brandy at a temperature of 110° F. is an excellent procedure to follow. The transfusion of 500 cc. of blood is strongly recommended by Crile. During the Great War gum acacia was used intravenously by some surgeons as a routine in cases of shock. There were a large number of deaths, both immediate and latent, after its use. As far as I know, the cause of these deaths was not determined. My personal experience with the method does not warrant an opinion.

Retention of urine is common after operations, especially under general anesthesia. This is particularly true following gynecological and rectal operations. Ordinarily the patient will void urine in from eight to twelve hours. If after twelve hours he has not voided, and examination shows a distended bladder, then he should immediately be catheterized. If the bladder is not distended, then he may be allowed another hour or two. Ordinarily it is not safe to wait more than thirteen or fourteen hours at the most. Hot application in the form of bags or stupes applied to the suprapubic region are frequently a great aid in stimulating micturition. Failing in this, a hot enema may be tried, in the hope that the patient may void while expelling the enema. Frequent change of position is also of undoubted assistance. Pouring water from one vessel into another within hearing distance of the patient has, on numerous occasions, started the flow of urine in a patient who had been catheterized several times. If, after the second day, a patient is still unable to urinate, it is justifiable to allow him to sit on the edge of the bed or to stand on the floor (properly supported) in the hope that this will start the flow. Pituitrin or caffeine-sodium-benzoate given under the skin may be of some benefit. If, after the initial catheterization, the patient is still unable to void urine, one must resort to the catheter again, and, after withdrawing the urine, an ounce of a one per cent. silver nitrate solu-

tion or an equal amount of a twenty per cent. argyrol solution should be instilled and left in the bladder. Of course the strictest asepsis should be exercised whenever it is necessary to catheterize a patient. A soft rubber catheter is the instrument of choice.

Feeding: As mentioned earlier, ordinary tap water in teaspoonful doses should be the first thing given to a patient by mouth. If it is retained without nausea, the amount can gradually be increased, until an ounce is given at frequent intervals. On the day following the operation our patients are allowed to have tea. It should not be the kind that brews continuously throughout the day, but should be weak and freshly made. It is given in two ounce feedings and may be sweetened with ordinary sugar. They are also allowed junket, zoolak, or oatmeal jelly, one ounce per feeding, alternating with the tea, and arranged so that they get one or the other every two or three hours. Water is given ad lib. in two ounce doses. The Murphy proctoclysis is discontinued as soon as the patient can retain water by mouth.

On the second day following the operation the patient is allowed, in addition to junket and oatmeal jelly, his choice of strained gruels, lemon or wine jelly, cocoa or cocoa shake and ice cream. He may have a feeding every two or three hours. On the third day following the operation he is allowed soft diet. This includes, in addition to the above, thick soups, milk toast, poached or boiled eggs, cereals, custards, rice, chopped beef, baked potato and baked apple. He should be given a feeding every three hours. On the fourth day following the operation he is allowed the regular hospital diet.

On his second day (third night) following the operation, the patient receives his cathartic. We generally give two Hinkel's or two alophen pills, and an enema the following morning. There are many other cathartics that are equally efficacious. The drastic members of this series should not be used.

By experience we find that it is wise, particularly in stomach cases, to withhold lemon and orange juice until after the patient has had his cathartic. These juices, if given earlier, unquestionably cause and increase nausea and cause a sour stomach with disagreeable eructations of gas. In ulcer cases, lemon and orange juice, together with the various broths, are interdicted during the patient's stay in the hospital. After a gastroenterostomy for ulcer of the stomach we proceed on the assumption that the patient has been prepared for a cure, and he is placed upon a Sippy diet during his stay in the hospital and after he leaves it.

When should a patient's *dressings* be changed? Assuming the case to be a simple appendicectomy, the patient having no elevated temperature after the third day and no pain in his wound, there is no indication and no reason for removing the adhesive straps until the time has arrived for removing the sutures. This should be done on the eighth or the ninth day. If there is a drain, as in cholecystectomy for example, then this should be removed in two or three days, the wound restrapped and left undisturbed until the sutures are to be removed. Too many of us inspect the patient's wound too often. If the wound is infected the patient will have a pain and his chart will show an elevated temperature. To remove a patient's dressing several times for purposes of inspection is not only bad technic, but a waste of time and money. A clean abdominal wound needs no attention until the sutures are to be removed.

Most abdominal cases are allowed to sit up in a wheel chair on the eighth day. They are permitted to walk on the following day and are sent home on the twelfth day. Patients operated upon for post-operative hernia are kept in bed until the tenth day.

The general rules for post-operative treatment at the Post-Graduate Hospital are quite well systematized. There are a number of definite laws that are always put into use, regardless of the type or kind of case. Other measures are purely symptomatic. Ordinarily, post-operative treatment is not difficult. The recalcitrant cases, however, are frequently a cause of considerable worry to the surgeon.

I wish to repeat that I have not attempted to review the subject of post-operative treatment. To do that would require several volumes. This paper is intended to be a short resume of the usual post-operative patient, with particular reference to the routine established at the New York Post Graduate Medical School and Hospital. Practically no complications have been considered.

"The changes and reactions of tissues after operation must be borne in mind when selecting the technic for any surgical procedure. It cannot be too often emphasized that surgery should be more a science than an art. A surgeon who is a dexterous operator and who skilfully amputates a leg that with patience and scientific application could be saved, is merely a good artisan, and is distinctly inferior to the surgeon who could save the leg even though he should be a bungling operator."—HORSLEY.

American Journal of Surgery
PUBLISHED BY THE
SURGERY PUBLISHING CO.
Established by J. MacDonald, Jr., M. D.

PUBLICATION OFFICE
STAR-GAZETTE BUILDING, ELMIRA, N. Y.

ADMINISTRATION AND EDITORIAL OFFICE
15 EAST 26TH ST., NEW YORK, U. S. A.
where all communications intended for the Editor, original articles, books for review, exchanges and business letters should be addressed.

SUBSCRIPTION PRICE, TWO DOLLARS
FOREIGN, TWELVE SHILLINGS.

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.
It is of advantage to submit typewritten manuscript; it avoids errors.
CHANGE OF ADDRESS. Subscribers changing their address *should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.*
ILLUSTRATIONS. Half-tones, line etchings and other illustrations will be furnished by the publishers when photographs or drawings are supplied by the author.

SPECIAL NOTICE TO SUBSCRIBERS
The "American Journal of Surgery" is never sent to any subscriber except on a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, B.S., M.D., F.A.C.S., *Editor*
New York City

ELMIRA, NEW YORK, JANUARY, 1923.

INSULIN.

The eyes of the medical world today are focused on "insulin", the remarkable extract of the island (Langerhans) bodies of the pancreas developed by F. G. Banting, a young surgeon of Toronto, with the assistance of C. H. Best, J. B. Collip and others working with him in the physiological laboratory of Professor MacLeod of the Toronto University. It has been shown, both in diabetic (depancreatized) animals and in diabetic humans that the administration of insulin restores, for the time being, carbohydrate metabolism, removing hyperglycemia and causing the disappearance of acetone bodies when present.

As now prepared insulin is extracted from adult ox pancreas by a process of fractional precipitation with alcohol. This sounds quite simple, but appears less so when one recalls that many had tried in vain to secure this pancreatic hormone freed from the destroying activity of the trypsin and other proteolytic enzymes present in pancreatic extracts. Nor was it arrived at simply by trial of chemical methods. The development of the procedure, step by step, has been modestly told by Banting, and is briefly outlined by MacLeod in *The British Medical Journal,* November 4, 1922. It sounds like a romance in physiology, but it is, in fact, a piece of perfect physiologic research. A remarkable feature of the work is that it was executed in all its steps from physiologic experiments, through chemical and biochemical studies, animal observations and clinical trial in little more than a year.

Insulin is not yet obtainable by the profession at large. It is still in the stage of carefully controlled observation by a few selected men in Canada and this country,* but their reports indicate beyond a reasonable doubt that Banting has made a brilliant contribution to medicine. Whether insulin will exercise any curative influence in diabetes it is too early to speculate. Perhaps, like thyroid extract, its effect will be only during the period of administration. Certainly, however, every surgeon, no less than his medical brothers, will hail an agency that will promptly reduce glycemia, remove acidosis and prevent diabetic coma!

From present accounts, it would appear that Banting has made one of the greatest advances in medicine of the twentieth century, probably the greatest therapeutic advance since the advent of salvarsan. And insulin with the life-saving powers that it has demonstrated, would, like so many other life-saving medical discoveries, have been impossible without animal experimentation!

PASTEUR.

At this writing various medical and other scientific societies are preparing to celebrate the centenary of the birth of one of the greatest men in the world's history, perhaps the greatest benefactor of human—and animal—kind, Louis Pasteur. Although not a physician, except by honorary degree, Pasteur may well be regarded as the founder of modern medicine. Antisepsis and asepsis, and our conception of infection, infectious diseases and immunization, involving as these do the fudamentals of present-day surgical and medical practice, are the results of his discoveries.

Pasteur established several new sciences: crystallography, bacteriology (in which he shares the honors with Koch, especially), immunology. He gave the death blow to "spontaneous generation", and demonstrated the nature of fermentation and the specificity of various fermentation agencies. He cured of their ills two great industries of France, wine-growing and silk culture. He established the now much employed method of milk and food preservation known as Pasteurization, he showed that the virulence of bacteria could be attentuated or increased through various processes of generation and culture, and he developed preventive and curative vaccinations against anthrax, chicken cholera and hydrophobia.

*The control of the manufacture and observation of insulin in Great Britain has been offered to the Medical Research Council.

In chemistry and physics his discoveries were likewise important and fundamental. None of his work, in any branch of science, has been shown to be wrong and, considering the prodigious output of his activities, this, too, is evidence of his genius. In his various professorial positions he stimulated research among others, and at the Institute Pasteur he had such brilliant pupils as Roux,. Metchnikoff, Calmette, Chamberland, Yersin, Chantemesse.

At this time of troubled world conditions, let those inclined to harsh criticisms of France remember the world's debt to her great sons—greatest of all, Louis Pasteur.

Progress in Surgery

Selections from Recent Literature

The Delayed Pedicle Flap in Plastic Surgery of the Face and Neck. GORDON B. NEW, Rochester, Minn. *Minnesota Medicine,* December, 1922.

New regards as the most satisfactory method to obtain a pedicled flap, the so-called delayed flap of Blair. The flap is outlined and elevated from the surrounding tissue, as if it were to be transferred, but instead it is returned into the wound and re-sutured in its original bed. The sutures should be separated sufficiently to allow oozing between them. Firm pressure is applied by means of gauze and adhesive plaster for at least a week to hold the flap in place and to prevent the collection of blood or serum under it. Although the method necessitates an additional step in the operation, it insures the blood supply and any part of the distal end of the flap is rarely lost. Another advantage of the delayed flap is that when the transfer is made, the skin is thin and flattened like normal skin and not thickened so that dissection of a core of the tissue is required, as is necessary in the tubed flap of Gillies.

Radiotherapy in Carcinoma of the Larynx—With Special Reference to Radium Needles Through the Thyrohyoid Membrane. GEORGE E. PFAHLER, Philadelphia, Pa. *The Journal of Radiolgy,* December, 1922.

Unless the patient is treated very early and before there are obstructive symptoms, it is desirable to do a tracheotomy before beginning treatment.

The roentgen rays applied externally, alone, justify the hope, even in advanced cases, of temporary recovery, or at least partial relief of symptoms.

The insertion of radium needles through the thyrohyoid membrane into the diseased tissue is practical, and the results so far obtained seem to justify further trial.

These patients should be kept under close observation for several years, for the results of this treatment, as well as that recorded by others show a marked tendency to recurrence. Each case must be judged by itself and the treatment directed to the condition present.

An X-Ray Demonstration of the Nasolacrimal Passageways—Normal and Obstructed. HOWARD P DOUB and JOHN M. CARTER, Detroit, Mich. *The Journal of Radiology,* December, 1922.

An attempt has been made in this work to produce a radiograph of the portion of the lacrimal sac above a stricture, in relation to the surrounding structures, and also to show the size of the opening in the lateral wall of the nose following the intranasal type of operation.

The technic followed in this work has been, first, to undertake the usual routine of attempting to syringe solutions, by way of the puncta, through the sac and duct into the nose. This is accomplished by first dropping a few drops of two per cent cocain solution on the lower lid. The sac is then cleared of mucus or pus by pressure over this. The passage is then syringed out with normal saline solution to which a few drops of 1 to 1,000 adrenalin solution have been added. It may be desirable to dilate the puncta slightly, but under no circumstances slit the canaliculus. It is also necessary in some cases to obstruct the puncta not used in the injection and this may be done with a common pin. The passages are then injected with the bismuth paste, using for this an ordinary all glass Luer syringe and a No. 19 blunt needle. When necessary to warm the bismuth, dry heat should be used, as steam will precipitate the oil out and difficulty will be experienced in getting an even flow through the fine caliber needle. About 1 cc. will be used on those cases without obstruction, while one-half that amount will usually suffice in those with obstruction.

There is no harmful effect associated with this procedure either in the normal or obstructed passageway, if it is carried out by some one familiar with the technic of syringing the passageways and if ordinary care is exercised. If properly done the patient usually complains of no discomfort from this injection.

Following the injection radiographs in several positions are made.

Carcinoma of the Breast in Men. (*Zur Kasuistik der Mammacarcinome bei Männern.*) DR. ANTON MULLEDER. *Archiv für klinische Chirurgie,* 1922, 120, No. 4.

Carcinoma of the breast in the male comprises 2 per cent of all breast carcinomata. Although axillary lymphatic involvement is common, it is rare for it to spread into the supraclavicular fossa. Radiation alone is insufficient; but it is valuable in the after-treatment. Insufficiently powerful apparatus is harmful. The after-results indicate that carcinoma of the breast in the male is a most serious malady and deserves a bad prognosis.

Studies on the Function of the Bile Passages Under Normal and Certain Abnormal Conditions. (*Studien über Die Funktion der Gallenwege unter normalen und gewissen abnormen Verhaltnissen.*) By JOHN BERG. *Acta Chirurgica Scandinavica, Supplement* II. 1922.

The points brought out include: A continuously working mechanism regulating the pressure in the bile passages; this is accomplished partly by resorption of bile and changes in the liver secretion with increase in the mucous elements, and also by a system of connecting extrahepatic canals; it is guarded by an efficiently working sphincter. The normal variations include a "cholefluxions type"—characterized by relaxation of the sphincter, and lowered pressure and secretion—and a "mukoflexionstype" with opposite characteristics. The biological mechanism includes reflex effects and mechanical factors.

The tendency to a chronic increase in pressure is at first regulated by the normal mechanisms, later by dilatation. When the latter is in the extrahepatic system there is a bile stasis; when in the gall-bladder there is a mucous stasis. The danger exists when the process extends into the liver and causes secondary changes about the bile passages. Both types of stasis give a satisfactory explanation to the author for the formation of calculi.

Surgery of Acute Conditions of the Gall-Bladder. EDWARD S. JUDD AND WILLIAM P. HERBST, Rochester. Minn. *Minnesota Medicine,* December, 1922.

1. Gallstones and cholecystitis should no longer be considered separately. The infection in the gall-bladder is merely part of an infection which involves several other tissues.

2. Most marked changes may occur in the tissues of the gall-bladder without clinical manifestations.

3. Severe symptoms may occur in cases in which there is but little evidence of infection in the gall-bladder.

4. Acute perforation of the gall-bladder with general soiling of the abdomen does not often occur, but chronic perforation and fistula formation into the duodenum, stomach, or colon is not rare.

5. Much can be accomplished by adopting pre-operative measures in a jaundiced case.

6. Pancreatitis in association with cholecystitis occurs as chronic infection and as necrosis of the pancreatic tissues and fat elsewhere.

7. It is advisable to remove an acutely inflamed gall-bladder if the liver and pancreas are not extensively affected, and if there are no calculi in the common duct.

Chronic Duodenal Obstruction: Etiology, Symptoms and Treatment. E. P. QUAIN, Bismarck, North Dakota. *The Journal-Lancet,* December 1, 1922.

Two factors contribute to the cause of this condition; compression of the duodenum by the superior mesenteric artery due to a shortcoming of the mesentery of the small intestine; and, a freely movable right colon which, at times, causes the colica media artery to be tightly drawn across the front of the third portion of the duodenum. These variations of position and the pathologic changes produced thereby are discussed at length.

A positive diagnosis of duodenal obstruction can be made only by means of the *x*-ray. The treatment is both medical and surgical. The medical forms consist mainly of rest in bed after meals, elevation of the lower abdomen for one-half hour or an hour after meals, the knee-chest position whenever the obstructive symptoms appear, and the wearing of a pad properly adjusted over the lower abdomen. Good cooperation with the patient results in successful treatment.

When surgical operation is indicated, a thorough examination of all organs in the upper abdomen must be made after incision. The condition of the stomach, pylorus, gall-bladder, and the first and second portions of the duodenum must be ascertained. The situation of the right colon is of very great importance. The method of procedure is described by the author.

The Nonrecurrence of Gastric Cancer After Operation. SEYMOUR BASCH, New York. *New York Medical Journal and Medical Record,* December 6, 1922.

From his own experience and the follow-up reports of W. J. Mayo, Weil, Douglas, Deaver, and others, Basch concludes:

The general pessimism as to the end-results in timely recognized and immediately operated upon gastric carcinoma is not justified. This applies particularly to cases in which the diagnosis has been predicated upon a thorough study of the clinical history and the faintest early indications, rather than upon the later appearance of the classical proofs of malignancy.

The signs described in the literature as characteristeic of early carcinoma are so definite that a diagnosis made only after their appearance is already tardy. More should be expected of the physician's diagnostic sense, so that the patient is operated upon early enough to have the best possible chance for cure.

Experiences with Operation for Gastroptosis. (*Erfahurngen mit der Operation der Gastroptose.*) G. PERTHES.. *Archiv für klinische Chirurgie,* 1922, 120, No. 3.

The symptoms of gastroptosis are mostly due to a flexions stenosis between the upper and middle parts of the duodenum. In some of the cases stasis in the bile passages follow. Gastroptosis may have as one of its symptoms hemorrhage, which may be confused with that of ulcer. The stomach can be given a new support on the left costal arch through the agency of the ligamentum teres. In 17 cases, who were followed up and examined, 11 were symptom-free, 3 much improved, 2 slightly improved, 1 not bettered. In 9 patients observed longer than one year, 2 were much improved, and 7 were symptom-free. These results are explained as having been found in persons with normal muscular tonus. Further study is necessary in those with atonic stomachs.

Two Hundred Syphilitic Patients Whose Chief Complaint was "Stomach Trouble"; An Interpretative Analysis of the Diagnosis of Syphilis in Consultant Medical Practice. JOHN H. STOKES and PHILIP W. BROWN, Rochester, Minn. *The American Journal of the Medical Sciences,* December, 1922.

Eighteen per cent of the patients with stomach trouble had had needless operations. In all but 2 of 35 patients there were clues to the underlying syphilis, which were not followed up, or a negative Wassermann reaction that had been accepted as final, when other evidence of syphilis could have been found. One-third of the needles laparotomies were on patients with gastric crisis.

When the question of operable malignant growth is raised, exploration should precede a therapeutic test for syphilis. If there is no reasonable probability of an operable malignant growth being present, or if the lesion appears inoperable with syphilis present, treatment for syphilis should precede operation.

A general raising of the "index of suspicion" for syphilis, among internists and surgeons, would reduce operative mistakes in patients with abdominal symptoms. A blood Wassermann test is often insufficient to clarify the situation, but should at least be routine. Surgeons should not ignore positive Wassermann reactions obtained before operation.

Striking symptomatic improvement was observed in certain cases of gastric and duodenal ulcer in neurosyphilitic patients in whom the roentgen ray after treatment showed the lesions itself to be still present.

The spinal fluid examination stands out from this investigation as a procedure of the highest importance, outranking the serum Wassermann reaction in diagnostic syphilology as applied to internal medicine. Its wider use for diagnosis should be developed with proper facilities for its performance and control.

Appendicitis and Peritonitis in Pregnancy. (*Ueber Appendicitis und Peritonitis in Gravidate.*) A. SZENES. *Archiv für klinische Chirurgie,* 1922, 120, No. 4.

Four cases of appendicitis are reported which occurred during pregnancy. One of the cases, in the second month, underwent an uneventful recovery, despite the fact that the appendix had perforated. Another in the sixth month had a peritonitis, and despite the development of an ileus for which a secondary operation was necessary, finally recovered. In the last case abortion occurred 23 days after the appendicectomy, and strepteococci were found in the placenta; and an investigation made in dogs by the author tends to show that this occurred as a hematogenous infection.

Is the Usual Method of Preparing Patients for Delivery Beneficial or Necessary? R. A. JOHNSTON and R. S. SIDALL, Baltimore. *The American Journal of Obstetrics and Gynecology,* December, 1922.

The authors' findings indicate that many factors play a part in the causation of morbidity. Operative interference doubled the incidence of morbidity. Vaginal examination, regardless of sterile gloves, increased the danger to the patient. Catharsis and laceration of the perineum ordinarily do not influence the puerperium. The increase in morbidity in the cases of premature rupture of the membranes is due most probably to other factors and not to the length of time the uterus is drained. Better results were obtained in a limited number of patients not prepared routinely. The use of picric acid theoretically may give excellent results in the preparation of patients for delivery, and further study of results following its use is indicated.

Postabortal Hemolytic Streptococcemia. PHILIP F. WILLIAMS, Philadelphia. *The American Journal of Obstetrics and Gynecology,* December, 1922.

Four cases are recorded of postabortal hemolytic, streptococcic bacteremia, with recovery under the use of polyvalent antistreptococcic serum. Illegal instrumentation to produce abortion is considered as the chief etiologic factor in the production of three of these infections. The dangers of nonaseptic procedures are made well evident when one considers that in a series of 100 women, seven harbored the hemolytic streptococcus in the cervical canal, and eleven others showed nonhemolytic types. A prompt diagnosis of the exact nature of such febrile conditions is best made by early, and if necessary, repeated blood cultures. Cervical cultures, if positive, and showing the same organism as that recovered from the blood stream, are of value in supporting the theory of the causation of these infections. Serum should be given early and in repeated doses, ranging from 50 to 100 cc., depending upon clinical and laboratory findings. Reactions are the rule and vary from mild to severe chills and skin rashes. Desensitization may be necessary in cases of

severe reactions. The action of the hemolytic streptococcus on the circulating blood has not been as severe as might have been supposed. The cases reported showed but little gross pelvic disease, the most noteworthy finding being a slight degree of peritonitis and parametritis.

The Use of Radium in the Treatment of Uterine Bleeding Other Than Cancer. HARRY B. MATTHEWS, Brooklyn, N. Y. *New York State Journal of Medicine,* December, 1922.

Radium has a very definite place in the treatment of certain forms of intractable uterine bleeding of non-malignant origin. Ninety-eight per cent of the cases in Matthews' series of 108 cases were completely controlled. Radium in properly selected cases, has no mortality and very little, if any, morbidity. Radium therapy has very definite contraindications and the selection of cases suitable for irradiation should remain in the hands of those who have had special training in gynecological diagnosis as well as radium therapy. For the purpose of excluding the possibility of cancer, a diagnostic curretteage should precede every intra-uterine applicateion of radium. From 100 to 150 mgs. of radium element is sufficient to obtain satisfactory results in the group of cases under consideration. The average "dose of radium" for those women over 35 years of age, except in certain special cases, should be 120 mg. hrs., while for those under 35 years, the "dose" should vary between 200 and 800 mg. hrs. **The indiscriminate intra-uterine use of radium** cannot be too strongly condemned, inasmuch as such practice can only bring discredit to a very valuable therapeutic agent.

The Rubin Test and Its Therapeutic Application. JOHN C. HIRST and CHARLES MAZER, Philadelphia. *The American Journal of Obstetrics and Gynecology,* December, 1922.

Before proceeding with the treatment of a case of sterility, it is imperative to determine the patency of the tubes, assuming that the male element is not a factor in the sterility.

Nonpatency is more frequent than previous records indicate.

The Rubin test is a safe procedure in the hands of the average gynecologist.

The transuterine route of pneumoperitoneum for *x*-ray purposes is better for gynecologic diagnosis than the transabdominal route.

The therapeutic possibilities of intrauterine gas inflation deserve attention on the part of the gynecologist.

An Improved Method of Supporting the Bladder and Vagina After Vaginal Hysterectomy for Procidentia. ALFRED HEINEBERG, Philadelphia. *The American Journal of Obstetrics and Gynecology,* December, 1922.

The author describes the technic used by him for disposing of the stumps of the broad ligaments, and concludes that the advantages of crossing the broad ligaments and attaching each to the vaginal wall of the opposite side are:

(a) To form a shelf for the bladder.

(b) To close the opening in the vagina by means of the oblique traction upon its walls.

c) To prevent dilatation of the vaginal vault and consequent lessening of the support to the base of the bladder.

The Question of Recurrent Renal Calculi. J. DELLINGER BARNEY, Boston. *Surgery, Gynecology and Obstetrics,* December, 1922.

While the few data at hand show that stones are subsequently found in the kidney after operation in a surprising number of instances, it is impossible to say which of these stones are "recurrences" and which are "left-overs." Actual recurrence is unquestionably very frequent. The complex character of the interior of the kidney, hemorrhage from its mucosa, and the comparative inaccessability of this organ in many cases contribute to the difficulties in removing all stones. Although various procedures may be resorted to for this purpose, none is infallible. It would appear that the fluoroscope offers the most promising prospects for success. Pre-operative study cannot be too painstaking, nor must the possibility of superimposed shadows of calculi be overlooked. A second operation for the removal of remaining stones is advisable in most cases and should be done soon after the first operation. Pyelotomy is unquestionably the operation of choice, and is often advantageously combined with partial nephrotomy.

Primary Tumors of the Ureter. PAUL W. ASCHNER, New York City. *Surgery, Gynecology and Obstetrics,* December, 1922.

Aschner reviews the reported cases of primary tumors of the ureter and classifies them as follows:

Papillomata	21
Papillary carcinomata	12
Non-papillary carcinomata	14
A. Squamous cell	(4)
B. Carcinoma solidum seu medullare	(10)

The chief manifestations of tumors of the ureter are hematuria, pain due to either renal colic, chronic distention of the kidney pelvis, or periureteral extension, and hydronephrosis. The difficulty of making a pre-operative diagnosis of ureter tumor is shown by the fact that it was attained in only four cases in which no tumor was visible cystoscopically, and in which no previous therapy or operation pointed to the true lesion.

In the case of visible tumor proven benign by biopsy, fulguration may be employed, but if ureteral bleeding continues or if there is no visible tumor, aseptic nephro-ureterectomy as described by Dr. Beer is the procedure indicated. A less extensive operation does not meet the indications, because, first, the kidney is probably rendered useless already, second, there may be multiple tumors in the pelvis and ureter, third, the tumor may be malignant. A partial resection of the bladder may be necessary in addition, when the growth involves the ureteral ostium.

Transplantation of a Portion of a Dog's Aorta to Replace a Like Portion of Human Urethra Which Had Been Destroyed. JAMES N. VANDER VEER and JOHN E. HESLIN, Albany, N. Y. *The Urologic and Cutaneous Review,* December, 1922.

The authors report the sucessful transplantation of a portion of a dog's aorta to replace an extensive defect in the urethra.

The artery (aorta) is preferable to the vein for such work, owing to its thicker, contractile wall. Short circuiting of the urinary flow for a long period is essential, to carry urine aside from the operative field. Strict attention to surgical detail, daily and careful oversight of the dressings are far more important than the mere mechanical detail of suturing in a portion of material.

The Treatment of Bladder Tuberculosis After Nephrectomy. EDWARD L. KEYES, New York. *New York State Journal of Medicine,* December, 1922.

The persistent grave symptoms of bladder tuberculosis are often not exclusively due to the tuberculosis as such, but rather to secondary infections or retentions and may at least be markedly ameliorated by dilatation of stricture and by the treatment of the bladder lesions topically through a straight tube urethroscope or cysteoscope as though they were ulcers of the Hunner type.

Cavernous Angioma of the Bladder. (*Das kavernöse Angiom der Blase.*) A. HÜBNER. *Archiv für klinische Chirurgie,* 1922, 120, No. 3.

Cavernous angioma of the bladder is a cause of severe hemorrhage of the bladder and should be kept in mind. The impossibility of controlling the hemorrhage in late cases, and the dangers resulting therefrom, give sufficient grounds for a wider knowledge of its clinical manifestations.

Operation for Spinal Cord Tumor and the Results. (*Operationen wegen Ruckenmarks tumor und ihre Resultate.*) E. RANZI. *Archiv für klinische Chirurgie,* 1922, 120, No. 3.

Stursberg's statistics in 1908 showed that the mortality of laminectomy for tumor in 119 cases was 27.7 per cent. This compares with Krause's figure of 20 per cent; with Sargent's figure of 18 per cent; with Elsberg's figure of 10.4

per cent; and with Bailey's figure of 4 per cent.

The late results of operation for tumor showed benefit in 57 per cent. This compares favorably with Oppenheim's figure of 50 per cent; with that of Sturzberg, 52 per cent; witeh that of Lenneps, 48 per cent. The best results follow operations for tumors of the spinal dura; the worst results follow operation for extradural tumor.

Surgery in Infantile Paralysis. MELVIN S. HENDERSON, Rochester, Minn. *Minnesota Medicine,* December, 1922.

Surgery is indicated only in the residual paralysis following poliomyelitis and only about 25 per cent of such patients can be helped by surgical procedures. As a rule manipulations precede tenotomies, and manipulations with tenotomies, osteotomies, the last named being resorted to only for correction of skeletal deformities. Arthrodeses are occasionally indicated, but should be performed only after a careful consideration of the power left so that the patient may use the fixed point to advantage.

The social status and the habits of the patient are to be seriously considered. Plastic operations on tendons are useful, but are applicable in only a small percentage of cases. A weak muscle must not be expected to do the work of a stronger muscle, particularly when it is placed in a new position and is usually at a mechanical disadvantage. Astragalectomy is the operation of choice for calcaneovalgus and in certain other conditions, but should always be accompanied by a posterior displacement of the foot.

Tuberculosis of Ankle Joint and Tarsus. HENRY J. FITZSIMMONS, Boston. *Boston Medical and Surgical Journal,* December 7, 1922.

In a comparison of data published in 1910 with records collected for the last ten years, the following conclusions are reached by the author:

Tuberculosis of the ankle joint and tarsus in children should be treated conservatively. Local rest by fixation, protecting against the strain and mechanical pressures which the individual bones or points are subjected to, should be rigidly enforced.

Heliotherapy definitely aids before as well as in the presence of sinuses. Operative interference should be resorted to only after careful consideration, and then the plan of procedure should be definitely understood. There is a greater danger of secondary involvement and general tuberculosis following operations than without. A large proportion of cases of tuberculosis of the ankle joint and tarsus get good functional results with very litle deformity, but are more likely to get these results in a shorter time by the nonoperative procedure.

The Efficient Treatment of Acute and Chronic, Simple, Traumatic Synovitis (Hemarthroses and Hydrarthroses) by Repeated Aspirations and Immediate, Active Mobilizations without Splinting. CLARENCE A. MCWILLIAMS, New York. *Annals of Surgery,* December, 1922.

Repeated aspirations combined with active (never passive) motions, and walking without splints afford the best method of treatment of acute and chronic, traumatic, joint synovitis, provided there be no joint mouse nor dislocated meniscus present.

Aspiration should be immediately performed in all types of traumatic joint effusions as it relieves pain immediately, renders a correct diagnosis more certain, prevents stretching of the ligaments with their consequent weakening, and avoids subsequent muscular atrophy.

Such treatment makes unnecessary all other subsequent physiotherapeutic measures, hence its simplicity makes it applicable to all classes of patients. Such a method of treatment produces a more perfect cure in one-half of the time that is required by the old immobilization method.

can be immediately sent home walking. The effects of

To leave fluid in a knee, the result of trauma, is just as irrational as to leave fluid in a chest unaspirated. Aspiration of a knee is a simpler procedure and less dangerous than aspiration of a chest, and can safely be performed in a doctor's office or a dispensary, and the patient thereafter physiotherapeutical measures have been overestimated, being used empirically and without foundation. They are makeshifts to excuse procrastination in not applying a radical, curative procedure such as aspiration.

Joint Mice. (*Beitrage zur Lehre den Gelenkmäusen.*) A. HARTWICH. *Archiv für klinische Chirurgie,* 1922, 120, No. 3.

Up to the present there have been insurmountable difficulties in the roentgenological and histological study of the origin of joint mice. Clinically these follow a trauma. Some of the author's preparations indicate the tearing away of some scar tissue. Some of his cases have shown pictures indicative of an arthritis deformans or an osteoarthritis.

The Etiology of Schlatter's Disease. (*Zur Etiologie des Schlatterschen Krankheit.*) W. RIEDER. *Archiv für klinische Chirurgie,* 1922, 120, No. 3.

No definite etilogical cause of an anatomico-pathological nature has heretofore been presented to explain this disease, but Rieder believes that a late rachitis has some influence, and for this purpose some studies are now being undertaken. Clinically Rieder's experience does not indicate that this combination occurs as frequently as was thought by Fromme.

In most of the cases, Rieder believes, that the essential trauma was aided by a "hungerosteoporose" or a "hungerosteomalacie."

The best method of treatment consists in excising the torn off process of tiba; this gives the shortest time for healing and excellent functional results.

Injuries to the Crucial Ligaments and Avulsion of the Tibial Spine. CHARLES F. PAINTER,Boston. *The Boston Medical and Surgical Journal,* November 30, 1922.

Ruptures of crucial ligaments are not as serious affairs as at one time they were credited with being. Very serviceable joints may be expected after injuries of this nature and the operative methods employed may be counted upon to restabilize the joints with very little surgical risk. It would not appear that in the majority of instances the conditions call for the tunneling operations and transference of muscles or transplants of fascia. Through the median patellar incision the opportunity to deal pretty directly with the crucials enables one to repair them or bridge them so that they repair themselves. Protection with a "cage" splint for several months after walking is commenced should be insisted upon.

The probable reason for the comparatively good functional results that follow upon injuries that theoretically seem as though they were certain to be more or less serious, is that the contours of the articular surfaces of femur and tibia are not disturbed in the ligamentous tears. If they become distorted, motion is lost and function is impaired, but when they are spared from injury the repair of these structures ensures a very considerable and generally fairly complete restoration to function.

An arthritic patient who lies abed for a long time with legs in slight flexion or complete extension will square off his condyles and subluxate his tibiae to such an extent as to completely incapacitate him even before he has eroded his cartilage or injured his capsule or ligaments enough to produce an incapacitating arthritic condition. If such osseous distortions may be avoided, there is scarcely any limit to the amount of legitimate optimism we may entertain as to the possibilities of repair and restoration of function in a knee-joint.

Suppurative Osteomyelitis Due to the Colon Bacillus. NATHAN WINSLOW, Baltimore. *Annals of Surgery.* December, 1922.

Winslow reviews 7 cases. The bones involved were: femur, 3 times; costal cartilages, 3 times; tibia, once. In those cases in which the colon bacillus was recovered in pure culture, but a single bone was involved, while in the instances of mixed infection both femora were diseased. The time of the appearance of the lesion was: initial lesion, 1; fourth week of illness, 1; near the close of a typical typhoid, 1; six weeks after onset of typhoid, 2; five months after the receipt of injury, 1; twenty years after the attack of typhoid, 1. In one case no diagnosis was made; in one the bone lesion followed a gunshot fracture of the tibia; while in the remaining five the patient had had typhoid-like attacks. The two cases with mixed infection died. The patient in whom the organism was recovered from the tibia recovered only after an amputation through the thigh. The three instances of costal chondritis all recovered after complete extirpation

of the cartilage involved. The man suffering with the infection at the lower end of the femur has been cured of the osteomyelitis, but is still confined to the hospital on account of bed-sores.

The author concludes that this type of osteomyelitis may occasionally undergo spontaneous resolution; that it may occur in either an acute or chronic form; that it has periods of quiescence and activity; that a most thorough eradication of the diseased bone is necessary to effect a permanent cure; that vaccine treatment may prove valuable in stubborn cases. The prognosis is relatively favorable .

Involvement of the Lymph-Nodes in Carcinoma of the Rectum. JAMES ROBERT MCVAY, Rochester, Minn. *Annals of Surgery,* December, 1922.

Rectal carcinomas are the most common form of intestinal neoplasms and make up 4 per cent of all the cancers of the body. The majority of patients are in the sixth decade. The males predominate slightly. The location of the growth on the rectal wall varies. About as many occupy the anterior wall as the posterior. The greater number of the growths are from the ampulla to the recto-sigmoidal juncture. Adenocarcinoma is the most common type. Metastasis to the glands usually takes place slowly and the liver is the organ most affected by secondary growths. The other organs of the body are only rarely affected.

The size of the growth in the rectum cannot be relied on as an accurate index of the probable lymphatic involvement. The growths without lymphatic involvement tend to grow into the lumen of the bowel. The growths with slight lymphatic involvement tend to spread by direct extension and are slow growing. Carcinomas of the rectum with entensive lymph-glandular involvement tend to metastasize through the lymph-stream early. Occasionally metastasis may take place by emboli breaking off into the portal veins.

Metastatic lymph-glandular involvement can be definitely detrmined only by systematic microscopic study of all the regional lymph-nodes. The size of the lymph-node is not an effectual means of determining whether or not there is metastatic involvement. This is especially true if the amount of involvement is small, or if the process is an early one.

Systematic microscopic examination of all the regional lymph-nodes in carcinoma of the rectum offers, as it does in cancer of the stomach, the best method of establishing an accurate prognosis for the case.

A Scalping Operation for Abscess About the Rectum. W. A. FANSLER, Minneapolis, Minn. *The Journal-Lancet,* November 15, 1922.

A liberal cross incision is made as near the anus as possible, and the extent of the abscess cavity is explored with the finger and probe. This having been done, the four segments of skin, made by the incision, are removed, giving an approximately circular opening. The size of this opening depends on the size of the abscess cavity, the general principle being to have the circle of skin removed slightly larger than the greatest diameter of the abscess. This, however, is subject to any variation judgment may dictate.

There is thus a cavity which has approximate shape of a truncated cone, the base being outward. A cavity of this shape is easily dressed and cleansed, and, what is more important, medication may be accurately applied to the depth of the wound. Where this can be done the use of nitric acid or 40 per cent silver nitrate will frequently heal a small opening into the bowel, and the case be terminated successfully as though only a simple abscess were present.

If later division of the sphincter is necessary the patient is in no worse condition than following ordinary incision of the abscess, and in fact the secondary operation is usually more simple, inasmuch as the tract is definitely defined.

It might seem that, with the removal of a flap of skin in this manner, convalescence would be prolonged. This is not the case. By the time the wound has granulated from the bottom, the skin has contracted and healed down to meet it, and there is little delay in complete healing.

Blocking the Superior Maxillary Nerve and Its Branches. MENDEL NEVIN, Brooklyn, New York. *Dental Items of Interest,* October, 1922.

Nevin thus describes his technic of posterior infraorbital injection:

A 42 mm. 22-gauge irridio-platinum needle, mounted on a right angle attachment, is used.

The malar process is then palpated with the index finger in order to determine the point of insertion of the needle so as to clear the malar process. This point generally corresponds to the apices of the second molar tooth in an adult. The cheek is then pushed away with the index finger of the left hand and the reflection of the mucous membrane above the second molar tooth is painted with tincture of iodine. The syringe with the special needle is then picked up in a pen-like manner and the needle inserted slightly away from bone in the reflection of the mucous membrane above the second molar tooth or at the point clearing the malar process.

The needle is then advanced superiorly and internally endeavoring as much as possible to be in contact with the zygomatic surface of the superior maxilla, until about 30 mm. (1¼ in.) of the needle has disappeared into the tissues. Between three and four cc. of a 2 per cent. procaine solution is here slowly injected. As the needle is advancing in the tissues the operator is enabled to move the extension hub downward in order to approximate the needle to the posterior surface of the superior maxilla. The insertion of the needle above the second molar instead of the wisdom tooth will be found not only easier but will also enable the operator with greater facility to keep in contact with the posterior surface of the maxilla.

It is of great importance to remember that the needle should be directed at a distinct angle internally toward the pterygo-palatine fossa. If a line be drawn buccally from the upper to the lower molar teeth, the needle should assume an angle of about 30 degrees to this line. To make it still plainer, the needle (not the extension) should be at an angle of about 30 degrees to the buccinator muscle or the cheek. This is necessary in order to reach the infraorbital groove and the infraorbital nerve. The mistake frequently made here is to direct the needle only superiorly and not internally. In such cases the temporal fossa only will be entered, the solution will be deposited quite a distance away from the infraorbital nerve, and no anesthesia will be obtained.

In this injection the needle will frequently encounter bony obstruction. If the needle has been properly directed the under wing of the sphenoid or the sphenoidal spine will be encountered. Anesthesia in such cases will be obtained. Should the needle be directed too far posteriorly and not kept in proximity to the posterior surface of the superior maxilla, the external surface of the external pterygoid plate may be encountered and the external pterygoid muscle infiltrated with a possibility of invading the pterygoid plexus of veins and establishing hematoma.

The posterior infraorbital injection is as safe as any other nerve blocking injection. The part of the intratemporal fossa through which the needle travels is devoid of important structures. There are no arteries nor veins of any importance in this region nor are there any muscles to be injected, when the proper course is pursued. The internal maxillary artery on its course to the pterygo-palatine fossa is from 15 to 20 mm. away from the path of the needle. The space through whcih the needle travels is filled with adipose tissue. The dangers of the needle penetrating the spheno-maxillary fissure and entering the orbit are to be discounted. The tendency of the needle is to pass posteriorly, particularly when inserted too high. In order to penetrate the spheno-maxillary fissure it would be necessary to force the right angle attachment way back into the oral cavity, which is an impossibility.

A New Technic for Performing Perineal Prostatectomy. ARTHUR B. CECIL, Los Angeles. *Journal of the A. M. A.,* November 11, 1922.

The technic described is said to have as its advantages definite preservation of the external sphincter muscle; the ability to carry out the perineal dissection with a guiding finger in the rectum; location of the opening for drainage far back in the prostatic urethra, which tends towards more rapid healing, and the absence of scar formation in the region of the external sphincter muscle. The author has also devised a special bifid retractor for use in these cases.